UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,256	10/27/2003	Jan Mink	15436.247.31.1	2694

22913 7590 10/05/2004

WORKMAN NYDEGGER (F/K/A WORKMAN NYDEGGER & SEELEY)
60 EAST SOUTH TEMPLE
1000 EAGLE GATE TOWER
SALT LAKE CITY, UT 84111

EXAMINER	
KIM, JOANNE H	

ART UNIT	PAPER NUMBER
2883	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/694,256	MINK, JAN	
	Examiner	Art Unit	
	Joanne H. Kim	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) *23-32* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/27/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 5 and 12 are objected to because of the following informalities:

claim 5 recites "a mounting plate on the upper surface of the substrate" and claim 12 recites " a mounting plate supporting the substrate." The same term is used for different structures.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-8, 13-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu (U.S. Patent No. 6,731,424) in view of Jiang et al. (U.S. Patent Pub. No. 2003/0031430, hereinafter "Jiang").

4. Regarding claims 1, 4, 6, 7, and 16, Wu discloses a package for an optic device comprising: a substrate (214); and an optic device (semiconductor optical amplifier (SOA) chip 136) mounted over the substrate, the optic device having a first port and a second port (Fig. 21).

Wu does not disclose that the package includes a cap that forms a hermetic seal around the optic device and the cap includes a first window and a second window.

Jiang discloses a package for an optic device including a substrate, an optic device mounted over the substrate (204 or 212) and a cap/can (202 or 210) mounted on the substrate that forms a hermetic seal around the optic device thus forming a TO packaged optic device to seal out contaminants and to provide low-cost smaller package (Figs. 2A and 2B, and paragraph [0023]). Jiang also discloses that the cap comprises a metal and includes a light transmitting windows or lens (208 or 216).

It would have been obvious to modify Wu to include a cap forming a hermetic seal around the optic device and including windows such as that taught by Jiang in order to provide low-cost smaller package and to seal out contaminants to protect the optic device (i.e., SOA chip) while allowing light to propagate.

5. Regarding claims 2, 3 and 13, Wu discloses that the package includes a first optical fiber (132) and a second optical fiber (134) mounted over the upper surface of the substrate (214); a first lens (170) and a second lens (172) mounted over the surface of the substrate and in optical communication with the first optical fiber and the second optical fiber, respectively; and a housing surrounding the substrate (Figs. 21 and 22).

6. Regarding claim 5, the combination of Wu and Jiang discloses the package for an optic device including a cap that forms a hermetic seal around the optic device mounted on a substrate as discussed above in paragraph 4. Wu also discloses that the package includes a mounting plate on the substrate. Accordingly, the combination of Wu and Jiang discloses that the cap is attached to the mounting plate. Further, it is well

known that hermetic seals are typically made using a seal ring (i.e., mounting plate) to create a solderable surface.

7. Regarding claim 8, the combination of Wu and Jiang discloses the package for an optic device as discussed above in paragraph 4. Wu also discloses that the optic device is supported by a submount.

The combination of Wu and Jiang does not disclose that the submount is on a spacer block.

It would have been obvious to modify the combination of Wu and Jiang to include a spacer block supporting the submount in order to provide proper alignment between the optic device and an optical fiber.

8. Regarding claims 14, 15 and 18, the combination of Wu and Jiang discloses the package as discussed above in paragraph 4.

The combination of Wu and Jiang does not specifically disclose that 1) the housing includes a lid and a bottom portion, 2) the housing comprises plastic material and 3) the substrate comprises a ceramic substrate.

It is well known that plastic material is commonly used for a housing of an optic device due to its low cost and a ceramic substrate is commonly used for its high thermal conductivity. Further, it is well known that the housing comprises a lid and a bottom portion.

Accordingly, it would have been obvious to modify the combination of Wu and Jiang to use a housing, which includes a lid and a bottom, comprising plastic material in

order to reduce the manufacture cost and to use a substrate comprising a ceramic substrate to improve heat dissipation.

9. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Jiang as applied to claim 1 above, and further in view of Gilliland et al. (U.S. Patent No. 6,416,238, hereinafter "Gilliland ").

10. Regarding claim 9, the combination of Wu and Jiang discloses the package for an optic device including an optic device mounted on a submount as discussed above in paragraph 7.

The combination of Wu and Jiang does not specifically disclose that the submount has metal leads.

Gilliland discloses an optical device package including a submount (40) and an optical device (80) mounted on the submount. Gilliland also discloses that the sumbount has metal leads (90) for providing electrical connection to the optic device (Figs. 2 and 3; and column 6, lines 29-36).

It would have been obvious to modify the combination of Wu and Jiang so that the submount has metal leads in order to provide electrical connection to the optic device.

11. Regarding claims 10-12, the combination of Wu and Jiang discloses the package for an optic device including a substrate, an optic device mounted on the substrate and a cap that forms a hermetic seal around the optic device as discussed above in paragraph 4.

The combination of Wu and Jiang does not specifically disclose that the substrate comprises a first via hole located within a portion of the substrate enclosed by the cap, a second via hole located within a portion of the substrate not enclosed by the cap, and a mounting plate electrically coupling the first and the second via holes.

Gilliland discloses that the substrate includes a first via hole (44) for making electrical contact with the optic device in a first region (43) in which the optic device (70) is mounted and a second via hole (46) in a second region (42) electrically coupled to the first via hole (Fig. 5 and column 5, lines 36-41 and 51-53). Further, Gilliland discloses that the substrate includes a plate (60) supporting the substrate and electrically coupling the first via hole with the second via hole (Fig. 5 and column 6, lines 7-21).

It would have been obvious to modify the combination of Wu and Jiang to include a first via hole located within a portion of the substrate enclosed by the cap, a second via hole located within a portion of the substrate not enclosed by the cap, and a mounting plate electrically coupling the first and the second via holes in order to provide electrical connection to the optic device.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Jiang as applied to claim 1 above, and further in view of Kirkpatrick et al. (U.S. Patent Pub. No. 2004/0022476, hereinafter "Kirkpatrick").

The combination of Wu and Jiang discloses the package for an optic device as discussed above in paragraph 4.

The combination of Wu and Jiang does not specifically disclose that the substrate comprises a multi-layer ceramic substrate.

Kirkpatrick discloses a package for an optic device including a substrate comprising a multi-layer ceramic substrate (320, 340 and 360) and an optic device mounted over the substrate (Fig. 5 and paragraphs [0029] and [0030]).

It would have been obvious to modify the combination of Wu and Jiang to include a substrate comprising a multi-layer ceramic substrate in order to provide the required electrical connectivity.

13. Claims 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Jiang as applied to claim 1 above, and further in view of Kimura (U.S. Patent No. 5,848,210).

14. Regarding claims 19 and 20, the combination of Wu and Jiang discloses the package including a substrate comprising a ceramic substrate as discussed above in paragraph 7. Wu also discloses the package including a thermo-electric cooler (216).

The combination of Wu and Jiang does not specifically disclose that the ceramic substrate functions as a cool plate of the thermo-electric cooler and the thermo-electric cooler includes a plurality of semiconductor elements.

Kimura discloses a temperature controlled optical coupling structure including an optical coupling substrate (2) functions as a cool plate of a thermo-electric cooler (i.e., Peltier cooler) including a plurality of semiconductor elements (Figs. 3 and 6; and column 4, lines 3-6 and 37-46).

It would have been obvious to modify the combination of Wu and Jiang to include a Peltier cooler using the ceramic substrate as a cool plate such as that taught by Kimura in order to reduce a size of the package.

15. Regarding claims 21 and 22, the combination of Wu and Jiang discloses the package for an optic device as discussed above in paragraph 4. Wu also discloses that the package includes a thermo-electric cooler (216).

The combination of Wu and Jiang does not specifically disclose that the thermo-electric cooler has a cool plate and a warm plate and that the thermo-electric cooler includes a plurality of semiconductor elements.

Kimura discloses a temperature controlled optical coupling structure including a thermo-electric cooler (i.e., Peltier cooler) having a cool plate and a warm plate, wherein the cool plate is in thermal contact with an optical coupling substrate and the warm plate serves as a mounting plate for the package, and a plurality of semiconductor elements between the cool plate and the warm plate (Fig. 1; and column 3, lines 18-19 and 27-33).

It would have been obvious to further modify the combination of Wu and Jiang to include a thermo-electric cooler having a cool plate and a warm plate, wherein the cool plate is in thermal contact with an optical coupling substrate and the warm plate serves as a mounting plate for the package, and a plurality of semiconductor elements between the cool plate and the warm plate in order to control the temperature of an optic device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joanne H. Kim whose telephone number is (571) 272-2139. The examiner can normally be reached on 8:30 a.m. to 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joanne H. Kim
Examiner
Art Unit 2883

Jk/FGF

Frank G. Font
Supervisory Patent Examiner
Technology Center 2800